

# EMI CERTIFICATION REPORT

**Applicant:**

LG Electronics MobileComm U.S.A., Inc.

1000 Sylvan Avenue, Englewood Cliffs NJ 07632

**Date of Issue: February 21, 2014****Test Report No.: HCT-E-1402-F019****Test Site: HCT CO., LTD.****HCT FRN: 0005-8664-21****FCC ID:****ZNFVS876**

**Rule Part(s) / Standard(s)** : FCC PART 15 Subpart B Class B  
**Equipment Type** : Cellular/PCS CDMA/EVDO and LTE Phone with Bluetooth, WLAN and NFC  
**Model Name** : LG-VS876  
**Additional Model Name** : VS876, LGVS876, LG-AS876, AS876, LGAS876  
**Port / Connector(s)** : USB / Earphone Port  
**Date of Test** : February 19, 2014 – February 20, 2014

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4/2003. (See Test Report if any modifications were made for compliance)

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

HCT certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

**Tested By**

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Certification Division

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## DOCUMENT HISTORY

The revision history for this document is shown in table.

Version	Date	Description
HCT-E-1402-F019	February 21, 2014	Initial Release



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**ATTACHMENT: TEST SETUP PHOTOGRAPHS**



## 1. GENERAL INFORMATION

### 1.1 Product Description

Equipment Under Test is manufactured by **LG Electronics MobileComm U.S.A., Inc.**  
Its basic purpose is used for communications.

<b>Model Name</b>	LG-VS876
<b>Additional Model Name</b>	VS876, LGVS876, LG-AS876, AS876, LGAS876
<b>FCC ID</b>	ZNFVS876
<b>EUT Type</b>	Cellular/PCS CDMA/EVDO and LTE Phone with Bluetooth, WLAN and NFC
<b>TX Frequency</b>	824.70 MHz to 848.31 MHz (CDMA 850) 1 851.25 MHz to 1 908.75 MHz (CDMA 1 900) 1 710 MHz to 1 755 MHz (LTE B4) 777 MHz to 787 MHz (LTE B13)
<b>RX Frequency</b>	869.70 MHz to 893.31 MHz (CDMA 850) 1 931.25 MHz to 1 988.75 MHz (PCS CDMA =CDMA 1 900) 2 110 MHz to 2 155 MHz (LTE B4) 746 MHz to 756 MHz (LTE B13)

### 1.2 Related Submittal(s) / Grant(s)

Original submittal only.



### 1.3 Tested System Details

All equipment descriptions used in the tested system (including inserted cards) are:

Device Type	Model Name	Manufacturer	FCC ID / DoC	Connected To
EUT	LG-VS876	LG	ZNFVS876	Notebook PC Ear-phone
USB cable	EAD62432101	Ningbo BROAD	-	E.U.T Notebook PC
Ear-phone	SGEY0003744	CRESYN	-	E.U.T
Notebook PC	ProBook6560b	H.P	DoC	EUT Notebook PC adaptor
Notebook PC adaptor	PPP009D	DELTA Electronics (JIANGSU)LTD	-	Notebook PC
Gateway	MV440	Axesstel	PH7MV440	Notebook PC, Adaptor
Serial Mouse	Serial 2 Button mouse	Radio shack	FSUGMZE3	Notebook PC
Adaptor	DA-60M12	Yang Ming Industrial	-	Gateway
RJ45 cable	-	-	-	Notebook PC, Gateway
Micro SD card	8GB	SanDisk	-	E.U.T



## 1.4 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
EUT	Micro USB	Y	Y	(P,D)1.0
	Ear-phone	N/A	N	(D)1.1
Notebook PC	RJ 45	N/A	N	(D)1.5
	Serial (Mouse)	N/A	N	(D)1.8
	DC in	N	N/A	(P)1.8
Gateway	DC in	N	N/A	(P)1.8

\* The marked "(D)" means the data cable and "(P)" means the power cable.

## 1.5 Noise Suppression Parts on Cable. (I/O cable)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
EUT	Micro USB	N	N/A	Y	Both End
	Ear-phone	N	N/A	Y	EUT End
Notebook PC	RJ 45	N	N/A	N	N/A
	Serial (Mouse)	N	N/A	Y	Notebook PC End



## 1.6 Test Methodology

Both Conducted and Radiated testing was performed according to the procedures in ANSI C63.4/2003. Radiated testing was performed at an antenna to EUT distance of 3 m.

## 1.7 Test Facility

Chamber used to collect the test data is located at the 74, SEOICHEON-RO, 578BEON-GIL, MAJANG-MYEON, ICHEON-SI, GYEONGGI-DO, KOREA. Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4/2003.

Measurement Facilities	Reg. No.
Radiated Field strength measurement facility (3m)	90661 (June 21, 2011)
Radiated Field strength measurement facility (10m)	90661 (June 21, 2011)

## 1.8 Frequency Range of Radiated Measurements

An unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a Radiated Emission limit is specified, up to the frequency shown in the following table

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 to 108	1 000
108 to 500	2 000
500 to 1 000	5 000
Above 1 000	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower



## 2. SYSTEM TEST CONFIGURATION

### 2.1 Configuration of Test System

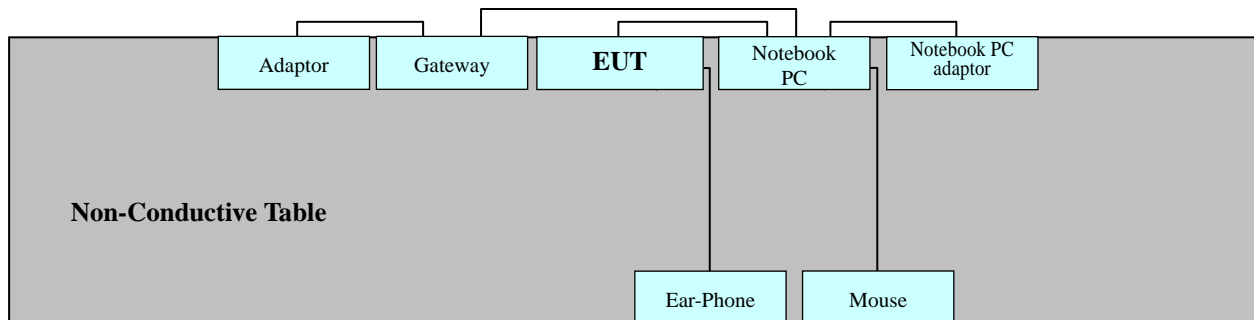
#### 2.1.1 Conducted Emission Test

EUT was connected to LISN via Notebook PC adaptor and Base Station. Preliminary Power Line Conducted Emission tests were performed by using the procedure in ANSI C63.4/2003 7.2.3 to determine the worst operating conditions.

#### 2.1.2 Radiated Emission Test

Preliminary Radiated Emission tests were performed by using the procedure in ANSI C63.4/2003 8.3.1.1 to determine the worst operating condition. Final Radiated Emission tests were performed at 3 m semi-anechoic chamber.

[ Configuration of Tested System ]



Power Line: 120 VAC





### 3. PRELIMINARY TEST

#### 3.1 Conducted Emission Test

- It was tested Data Communication mode, after connecting all peripheral devices.

**Operation Mode:**       Data Communication mode

#### 3.2 Radiated Emission Test

- It was tested Data Communication mode, after connecting all peripheral devices.

**Operation Mode:**       Data Communication mode



## 4. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

### 4.1 Conducted Emission Test

The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

Limit Apply to	: FCC PART 15 Subpart B Class B
Detector	: Quasi-Peak, Average (6 dB Bandwidth: 9 kHz)
Operation Mode	: Data Communication mode
Temperature	: 19.5°C
Humidity Level	: 23.2 %
Test Date	: February 19, 2014

Frequency (MHz)	Transd (dB)	Conductor	Quasi-Peak			Average		
			Limit (dBuV)	Measurement Level (dBuV)	Result Level (dBuV)	Limit (dBuV)	Measurement Level (dBuV)	Result Level (dBuV)
0.1950	9.7	N	63.8	40.1	49.8	53.8	20.8	30.5
0.2040	9.7	N	63.5	39.0	48.7	53.5	22.5	32.2
0.2040	9.7	L1	63.4	43.0	52.7	53.4	-	-
4.3880	10.1	L1	56.0	29.7	39.8	46.0	21.6	31.7

※ **NOTE:** Refer to page 11 to page 14 for details.

1. Conductor L1 = Hot, Conductor N = Neutral
  2. Transducer = LISN Factor + Cable Loss Factor
  3. Result Level = Measurement Level + Transducer Factor
- \* 'Result Level' in above table is same as the 'Quasi-Peak' and 'CAverage' of the test data



EMI Auto Test(1)

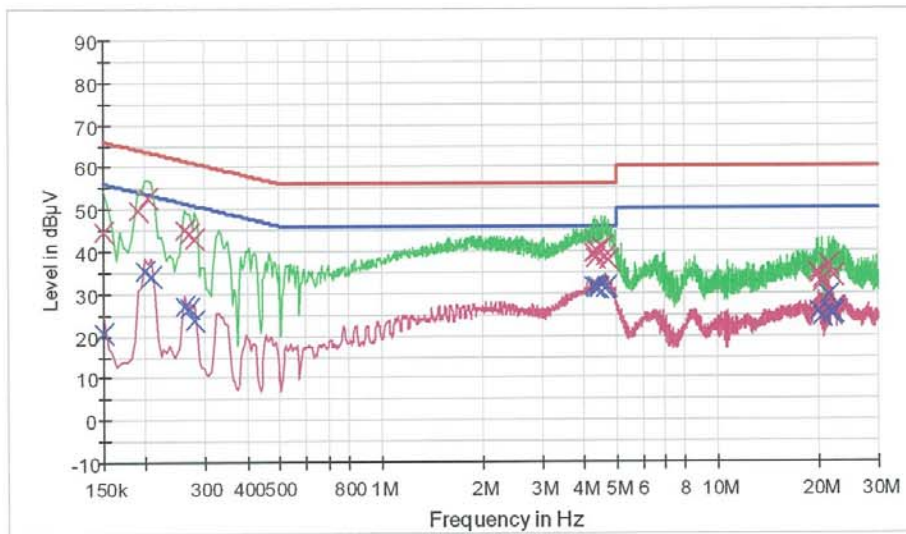
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# HCT TEST Report

## Common Information

EUT: LG-VS876  
 Manufacturer: LG  
 Test Site: SHIELD ROOM  
 Operating Conditions: DATA MODE  
 Operator Name:

FCC CLASS B



— FCCCLASS B\_OP     
 — FCCCLASS B\_AV     
 — Preview Result 1-PK+  
—x Preview Result 2-CPK     
 —x Final Result 1-CPK     
 —x Final Result 2-CAV

## Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	44.4	9.000	Off	L1	9.7	21.6	66.0
0.190500	49.8	9.000	Off	L1	9.7	14.2	64.0
0.204000	52.7	9.000	Off	L1	9.7	10.7	63.4
0.262500	45.1	9.000	Off	L1	9.7	16.3	61.4
0.271500	44.2	9.000	Off	L1	9.7	16.9	61.1
0.280500	42.9	9.000	Off	L1	9.7	17.9	60.8
4.298000	39.6	9.000	Off	L1	10.1	16.4	56.0
4.325000	38.2	9.000	Off	L1	10.1	17.8	56.0
4.388000	39.8	9.000	Off	L1	10.1	16.2	56.0
4.532000	41.0	9.000	Off	L1	10.1	15.0	56.0
4.608500	38.8	9.000	Off	L1	10.1	17.2	56.0
4.752500	38.0	9.000	Off	L1	10.1	18.0	56.0
19.832000	34.8	9.000	Off	L1	10.9	25.2	60.0
20.048000	34.4	9.000	Off	L1	10.9	25.6	60.0
20.471000	33.2	9.000	Off	L1	10.9	26.8	60.0
20.516000	32.6	9.000	Off	L1	10.9	27.4	60.0

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## EMI Auto Test(1)

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Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
21.389000	36.8	9.000	Off	L1	11.0	23.2	60.0
22.028000	34.1	9.000	Off	L1	11.0	25.9	60.0

## Final Result 2

Frequency (MHz)	CAverage (dB $\mu$ V)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.150000	20.8	9.000	Off	L1	9.7	35.2	56.0
0.199500	35.4	9.000	Off	L1	9.7	18.2	53.6
0.208500	34.2	9.000	Off	L1	9.7	19.1	53.3
0.262500	27.0	9.000	Off	L1	9.7	24.4	51.4
0.271500	26.6	9.000	Off	L1	9.7	24.5	51.1
0.280500	23.8	9.000	Off	L1	9.7	27.0	50.8
4.298000	31.6	9.000	Off	L1	10.1	14.4	46.0
4.325000	31.3	9.000	Off	L1	10.1	14.7	46.0
4.388000	31.7	9.000	Off	L1	10.1	14.3	46.0
4.428500	31.0	9.000	Off	L1	10.1	15.0	46.0
4.653500	31.1	9.000	Off	L1	10.1	14.9	46.0
4.662500	31.4	9.000	Off	L1	10.1	14.6	46.0
20.048000	25.8	9.000	Off	L1	10.9	24.2	50.0
20.516000	24.5	9.000	Off	L1	10.9	25.5	50.0
21.389000	29.4	9.000	Off	L1	11.0	20.6	50.0
21.744500	25.9	9.000	Off	L1	11.0	24.1	50.0
21.884000	24.8	9.000	Off	L1	11.0	25.2	50.0
22.028000	25.4	9.000	Off	L1	11.0	24.6	50.0

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EMI Auto Test(1)

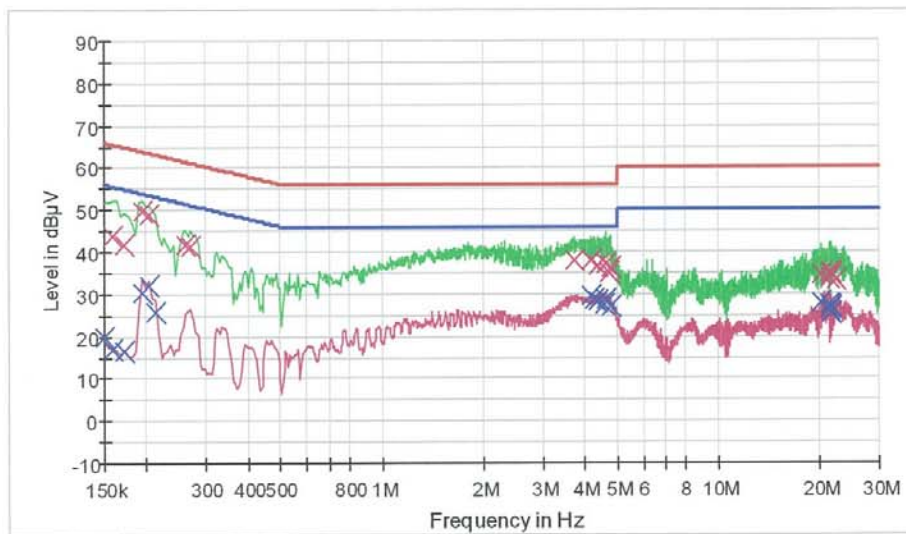
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# HCT TEST Report

## Common Information

EUT: LG-VS876  
 Manufacturer: LG  
 Test Site: SHIELD ROOM  
 Operating Conditions: DATA MODE  
 Operator Name:

FCC CLASS B



— FCCCLASS B\_QP      — FCCCLASS B\_AV      — Preview Result 1-PK+  
 — Preview Result 2-AVG      × Final Result 1-CPK      × Final Result 2-CAV

## Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.159000	43.8	9.000	Off	N	9.7	21.7	65.5
0.172500	41.7	9.000	Off	N	9.7	23.1	64.8
0.195000	49.8	9.000	Off	N	9.7	14.0	63.8
0.204000	48.7	9.000	Off	N	9.7	14.7	63.4
0.262500	41.8	9.000	Off	N	9.7	19.6	61.4
0.271500	41.2	9.000	Off	N	9.7	19.9	61.1
3.722000	38.1	9.000	Off	N	10.0	17.9	56.0
4.172000	38.0	9.000	Off	N	10.1	18.0	56.0
4.392500	36.7	9.000	Off	N	10.1	19.3	56.0
4.617500	37.1	9.000	Off	N	10.1	18.9	56.0
4.716500	34.9	9.000	Off	N	10.1	21.1	56.0
4.811000	36.0	9.000	Off	N	10.1	20.0	56.0
20.120000	34.5	9.000	Off	N	10.8	25.5	60.0
21.362000	33.9	9.000	Off	N	10.8	26.1	60.0
21.438500	34.9	9.000	Off	N	10.9	25.1	60.0
21.515000	35.1	9.000	Off	N	10.9	24.9	60.0

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## EMI Auto Test(1)

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Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
21.591500	34.5	9.000	Off	N	10.9	25.5	60.0
22.446500	33.5	9.000	Off	N	10.9	26.5	60.0

## Final Result 2

Frequency (MHz)	CAverage (dB $\mu$ V)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.150000	19.9	9.000	Off	N	9.7	36.1	56.0
0.159000	16.9	9.000	Off	N	9.7	38.6	55.5
0.172500	16.3	9.000	Off	N	9.7	38.5	54.8
0.195000	30.5	9.000	Off	N	9.7	23.3	53.8
0.204000	32.2	9.000	Off	N	9.7	21.2	53.4
0.213000	25.9	9.000	Off	N	9.7	27.2	53.1
4.172000	29.4	9.000	Off	N	10.1	16.6	46.0
4.302500	28.8	9.000	Off	N	10.1	17.2	46.0
4.392500	28.3	9.000	Off	N	10.1	17.7	46.0
4.604000	27.6	9.000	Off	N	10.1	18.4	46.0
4.617500	28.8	9.000	Off	N	10.1	17.2	46.0
4.811000	27.1	9.000	Off	N	10.1	18.9	46.0
20.120000	27.7	9.000	Off	N	10.8	22.3	50.0
21.362000	26.1	9.000	Off	N	10.8	23.9	50.0
21.438500	27.4	9.000	Off	N	10.9	22.6	50.0
21.515000	26.4	9.000	Off	N	10.9	23.6	50.0
21.591500	25.1	9.000	Off	N	10.9	24.9	50.0
21.650000	27.1	9.000	Off	N	10.9	22.9	50.0

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## 4.2 Radiated Emission Test

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

### -For measurement below 1 GHz

Limit Apply to	: FCC PART 15 Subpart B Class B
Detector	: Quasi-Peak (6 dB Bandwidth: 120 kHz)
Operation Mode	: Data Communication mode
Temperature	: 18.7C
Humidity Level	: 23.9 %
Test Date	: February 20, 2014

Frequency (MHz)	Reading (dBuV)	Polarity (H/V)	Antenna Height (m)	Correction Factor		Limit (dBuV/m)	Level (dBuV/m)	Margin (dB)
				Antenna (dB/m)	Cable (dB)			
99.9	19.74	H	3.14	9.20	3.76	43.5	32.70	10.80
375.0	16.54	H	1.00	15.08	4.79	46.0	36.40	9.60
625.0	12.54	V	1.00	19.97	5.39	46.0	37.90	8.10



### -For measurement above 1 GHz

Limit Apply to : FCC PART 15 Subpart B Class B

Detector : Peak mode: Peak (RBW: 1 MHz, VBW: 1 MHz)  
: Average mode: Peak (RBW: 1 MHz, VBW: 10 Hz)

Temperature : 19.1°C

Humidity Level : 24.1 %

Test Date : February 19, 2014

Frequency (GHz)	Peak			POL	Average		
	Total (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)		Total (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
1.3302	53.9	74	20.1	V	27.4	54	26.6
2.0936	51.5	74	22.5	V	29.0	54	25.0
2.6639	51.8	74	22.2	V	30.9	54	23.1

※ **NOTE:**

1. Measurement above 1 GHz was performed from 1 GHz to the 5<sup>th</sup> harmonic of highest fundamental frequency. Test was measured by 12 GHz.





## 5. FIELD STRENGTH CALCULATION

The field strength is calculated by adding the antenna factor and cable factor.  
The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dB $\mu$ V is obtained. The antenna factor of 7.4 dB/m and a cable factor of 1.1 dB are added. The 30 dB $\mu$ V/m value is mathematically converted to its corresponding level in  $\mu$ V/m.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dB}\mu\text{V/m}$$

### [Radiated Emission Limits]

Frequency of Emission (MHz)	Field Strength	
	$\mu$ V/m	dB $\mu$ V/m
30 to 88	100	40.0
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0



## 6. TEST EQUIPMENT

<u>Type</u>	<u>Manufacturer</u>	<u>Model Name</u>	<u>Serial Number</u>	<u>Calibration Cycle</u>	<u>Next CAL Date</u>
<b><u>Conducted Emission</u></b>					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	2014.04.25
<input checked="" type="checkbox"/> LISN	EMCO	3816/2SH	9706-1070	1 year	2014.04.26
<input checked="" type="checkbox"/> LISN	Rohde & Schwarz	ENV216	100073	1 year	2015.01.29
<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100033	1 year	2014.06.23
<input type="checkbox"/> LISN	Rohde & Schwarz	ESH3-Z5	100282	1 year	2014.07.03
<input type="checkbox"/> Attenuator	Rohde & Schwarz	ESH3-Z2	357.8810.352	1 year	2014.07.03
<b><u>Radiated Emission</u></b>					
<b>-For measurement below 1 GHz</b>					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	2014.04.16
<input checked="" type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB9160	3301	2 year	2014.12.17
<input checked="" type="checkbox"/> Antenna master	HD GmbH	MA240	240/520	N/A	-
<input checked="" type="checkbox"/> Turn Table	HD GmbH	2090	9702/1224	N/A	-
<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU 26	100241	1 year	2014.07.01
<input type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB9168	185	2 year	2015.04.16
<input type="checkbox"/> Antenna master	INNCO Systems	MA4000-EP	MA4000/283	N/A	-
<input type="checkbox"/> Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
<b>-For measurement above 1 GHz</b>					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	2014.04.16
<input checked="" type="checkbox"/> Antenna master	HD GmbH	MA240	240/520	N/A	-
<input checked="" type="checkbox"/> Turn Table	HD GmbH	2090	9702/1224	N/A	-
<input checked="" type="checkbox"/> Power Amplifier	CERNEX	CBLU1183540	21690	1 year	2014.07.12
<input checked="" type="checkbox"/> Horn Antenna	Schwarzbeck	BBHA 9120D	296	2 year	2014.12.13
<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU 26	100241	1 year	2014.07.01
<input type="checkbox"/> Antenna master	INNCO Systems	MA4000-EP	MA4000/283	N/A	-
<input type="checkbox"/> Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-



## 7. CONCLUSION

The data collected shows that the **EUT type: Cellular/PCS CDMA/EVDO and LTE Phone with Bluetooth, WLAN and NFC, FCC ID: ZNFVS876, Model: LG-VS876** complies with §15.107 and §15.109 of the FCC rules.